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NONDIRECTIVE PROMPTING AND NONCONTINGENT REINFORCEMENT IN THE TREATMENT OF DESTRUCTIVE BEHAVIOR DURING HYGIENE ROUTINES

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The escape-maintained destructive behavior of a girl with mental retardation persisted during hygiene routines with directive prompting, differential reinforcement for compliance, and extinction as treatment. Using nondirective prompting and noncontingent reinforcement, destructive behavior was reduced to near-zero levels during the hygiene routine.

DESCRIPTORS: escape, prompting, establishing operations, noncontingent reinforcement

Altering the manner in which tasks are presented (e.g., altering task novelty) can reduce escape-maintained destructive behavior (e.g., Smith, Iwata, Goh, & Shore, 1995). For example, Smith et al. held reinforcement (escape) constant while manipulating task novelty, session duration, and task presentation rate among individuals who displayed escape-maintained self-injurious behavior (SIB). They showed that these three antecedent variables functioned as establishing operations and altered the effectiveness of escape as reinforcement for SIB. Another method of decreasing the aversiveness of tasks is to pair them with positive reinforcement (Cooper et al., 1995). For example, Cooper et al. decreased the escape-maintained food refusal of 2 clients by presenting noncontingent toys and attention during meals. In the current investigation, the escape-maintained destructive behavior of a girl with mental retardation was reduced during academic tasks using a directive prompting procedure, differential reinforcement of compliance, and extinction for destructive behavior. However, destructive behavior persisted during hygiene routines. Therefore, we developed a treatment package to decrease the aversiveness of hygiene tasks by presenting them in a nondirective manner in combination with noncontingent access to reinforcement.

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METHOD

Cari, an 8-year-old girl who had been diagnosed with mild mental retardation and oppositional defiant disorder, was hospitalized for the treatment of destructive behavior (hitting, kicking, scratching, pinching, biting, and throwing or breaking objects). First, a functional analysis (Iwata, Slifer, Dorsey, Bauman, & Richman, 1982/1994) of Cari's destructive behavior was conducted. During demand sessions, the therapist used directive prompts (sequential verbal, gestural, and physical) to present academic tasks (e.g., "trace your name") approximately once every 30 s. If Cari engaged in destructive behavior, the therapist allowed a 30-s break from the task (i.e., escape). Based on this

Table 1
Examples of Directive and Nondirective Prompts

Directive	Nondirective
"Comb your hair."	"Your hair looks nice after you comb it."
"Brush your teeth."	"I wonder how this toothbrush works?"
"Put your shoes on."	"Whose shoes are these?"
"Wet your hair."	"This doll loves to put her hair in the water."
"Put your other sock on."	"Look, you have one sock on, where is the other one?"
"Put your shoe on."	"Does this go on your nose [referring to the shoe]?"

analysis, the treatment for Cari's escape-maintained destructive behavior consisted of directive prompting, differential reinforcement of task completion, and extinction for destructive behavior. Directive prompting (see Table 1) consisted of sequential verbal, gestural, and then physical prompts contingent upon noncompliance. Reinforcement (a 30-s break from instructions, social attention, and access to tangible items) was presented contingent upon task completion following either the verbal or gestural prompt on a fixed-ratio (FR) 1 schedule. Extinction consisted of discontinuation of escape (i.e., prompting continued independent of destructive behavior). When destructive behavior was reduced to near-zero levels, the schedule of reinforcement for compliance was thinned to a practical work-break schedule (indicated by school personnel) in which praise was delivered on an FR 1 schedule, and a 2-min break with access to attention and tangible reinforcement was provided contingent on task completion on an FR 10 schedule. The treatment then was extended successfully to the classroom, but was not effective in reducing destructive behavior during hygiene routines (e.g., toothbrushing, bathing).

A second treatment was evaluated during hygiene routines and was compared to the above treatment (henceforth called directive prompting) using an ABAB design. All sessions were conducted by one of two therapists (balanced across conditions), lasted 10 min, and were conducted in a bathroom (4 m by 3 m) containing a sink, toilet, and bathtub. Across both conditions, therapists followed a 60-step task analysis that was completed in two to three 10-min consecutive sessions that included toileting, bathing, dressing, toothbrushing, brushing hair, and clean-up activities. The subsequent treatment condition (henceforth called nondirective prompting) involved nondirective prompting, continuous noncontingent delivery of attention and tangible items, and extinction of destructive behavior. Nondirective prompts were verbal suggestions, cues, or physical movements that introduced or provided information about the next step in the routine to be completed. If Cari did not complete the task following the first cue, the therapist issued an additional cue. If Cari did not complete the task after the second cue, the therapist completed the task for her. Cari was not physically guided to complete any tasks. If she completed the task independently, the therapist delivered brief praise. Examples of directive and nondirective prompts appear in Table 1. Cari had continuous, noncontingent access to reinforcement (attention and tangible items) throughout the hygiene routine. If Cari engaged in destructive behavior, the nondirective prompts continued to be delivered. Two independent observers scored destructive behavior (as defined above) during 96.3% and 38.8% of sessions in the functional analysis and treatment analysis, respectively. Task completion, defined as Cari completing a step of the task analysis, was

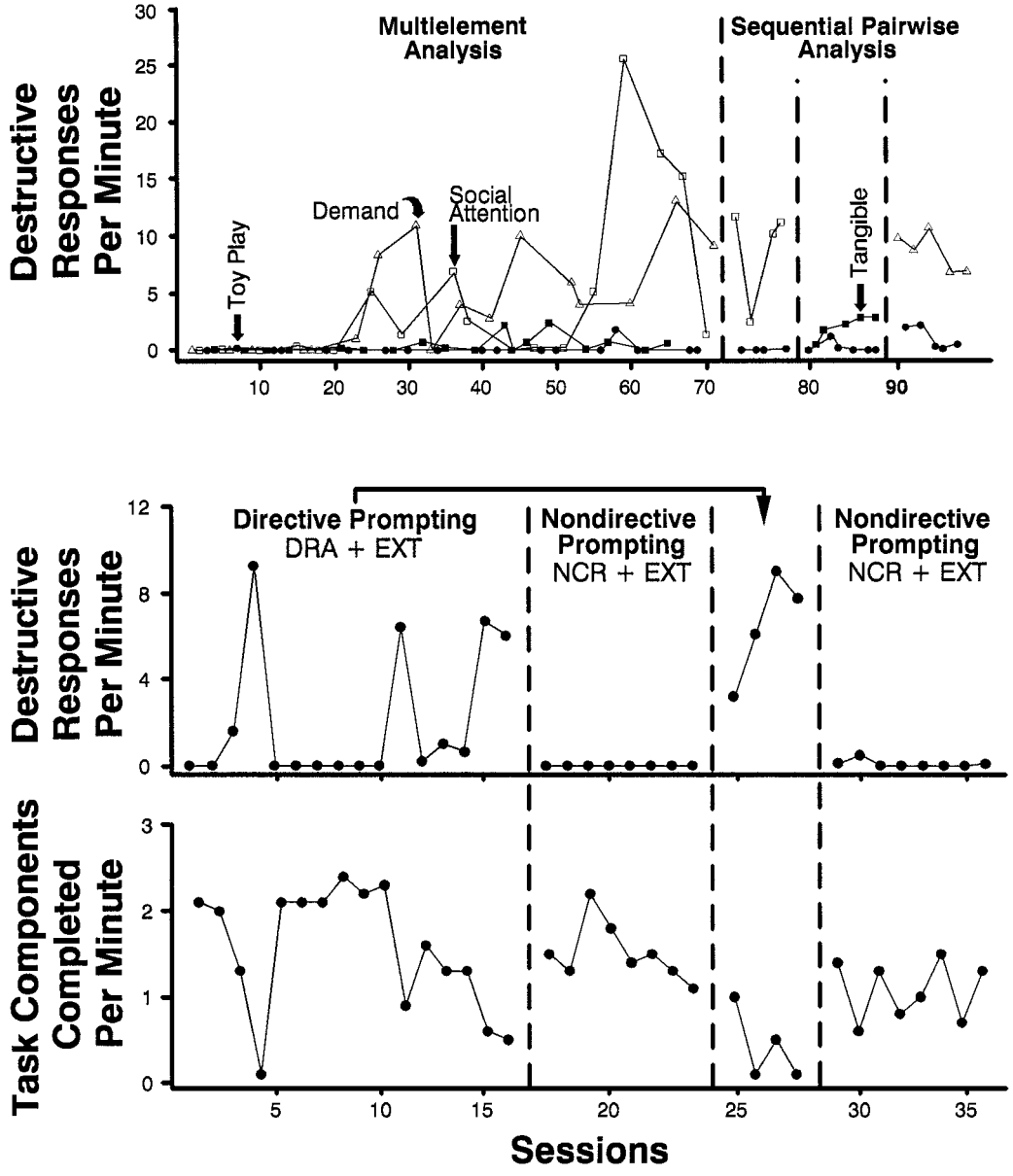

Figure 1. Rate of destructive behavior during the functional analysis (top panel). Rate of destructive behavior (middle panel) and task completion (bottom panel) during directive prompting plus differential reinforcement (DRA) plus extinction (EXT) versus nondirective prompting plus noncontingent reinforcement (NCR) plus extinction.

scored during all sessions of the treatment analysis. Exact agreement coefficients for destructive behavior were 97.9% and 92.7% for the functional analysis and treatment analysis, respectively. Exact agreement for tasks completed during the treatment analysis was 97.1%.

RESULTS AND DISCUSSION

The mean rates of destructive behavior during the functional analysis (Figure 1) were (a) demand, 11.8 responses per minute; (b) social attention, 8.9; (c) tangible, 2.1;

and (d) toy play, 0.4. The results of the functional analysis suggested that Cari's destructive behavior was sensitive to escape from demands, access to adult attention, and access to items as reinforcement. During the treatment analysis, destructive responding was high and variable (M = 2.0 and 6.5), and task completion decreased both within and across phases (M = 1.6 and 0.4) during the directive prompting procedure. During nondirective prompting, the rate of destructive behavior was markedly lower (M = 0 and 0.1), and task completion was more consistent across phases (M = 1.5 and 1.1). These results suggested that the modified treatment was effective in reducing destructive behavior during hygiene routines without reductions in task completion. Because the nondirective treatment involved multiple components, however, it is not clear which components were active in reducing destructive behavior.

In the current investigation, it is possible that treatment effectiveness was due to (a) the removal of direct instructions, (b) increases in the level of reinforcement as a result of noncontingent reinforcement, (c) the absence of physical guidance following noncompliance, or (d) some combination of the three. The direct instructions may have functioned as an establishing operation that increased the effectiveness of escape as reinforcement. That is, for some individuals, a particular task may be more aversive when the person is told to do it compared to when the task is presented as a game or a subtle suggestion. The continuous, noncontingent access to reinforcement during nondirective prompting also could have decreased the aversiveness of the tasks and thus reduced Cari's motivation to escape. By contrast, during directive prompting, the amount of reinforcement presented was much less because it was presented on an FR 10 schedule. The combination of nondirective prompting and noncontingent reinforcement also could have interacted to alter the hygiene situation so that it was more like interactive play and less like a demand situation. During play activities, requests are delivered frequently but in a qualitatively different and less directive manner than during work tasks. However, these conclusions remain speculative because a multicomponent treatment package was used in which multiple variables were manipulated across conditions. Further research is needed using methods similar to those of Cooper et al. (1995) and Smith et al. (1995) to evaluate the independent contributions of the various components of this treatment package while holding constant the consequence for problem behavior.

REFERENCES

Cooper, L. J., Wacker, D. P., McComas, J. J., Brown, K., Peck, S. M., Richman, D., Drew, J., Frischmeyer, P., & Millard, T. (1995). Use of component analyses to identify active variables in treatment packages for children with feeding disorders. *Journal of Applied Behavior Analysis, 28,* 139–153.

Iwata, B. A., Dorsey, M. F., Slifer, K. J., Bauman, K. E., & Richman, G. S. (1994). Toward a functional analysis of self-injury. *Journal of Applied Behavior Analysis, 27,* 197–209. (Reprinted from *Analysis and Intervention in Developmental Disabilities, 2,* 3–20, 1982)

Smith, R. G., Iwata, B. A., Goh, H. L., & Shore, B. A. (1995). Analysis of establishing operations for self-injury maintained by escape. *Journal of Applied Behavior Analysis, 28,* 515–535.

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